CLAIMS

What is claimed is:

1. A pad for chemical mechanical planarization of substrates for electronic device fabrication, the pad having a Shore D hardness greater than about 47, and the pad having a density of about 0.5 grams per cubic centimeter to about 0.7 grams per cubic centimeter.

2. The pad of claim 1, wherein the pad has a Shore D hardness from about 47 to about 57.

3. The pad of claim 1, wherein the pore structure is sufficient for transporting a polishing slurry for chemical mechanical planarization.

4. The pad of claim 3, wherein the pore structure is substantially homogeneous throughout the pad.

5. The pad of claim 3, wherein the pad has a Shore D hardness from about 51 to about 54.

6. The pad of claim 1, wherein the pad has a Shore D hardness from about 51 to about 54 and a density in the range of about 0.54 grams per cubic centimeter to about 0.62 grams per cubic centimeter.

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7. A pad comprising:

a non-woven felt, the felt having a density greater than about 0.29 grams per cubic centimeter; and

a polymer resin;

wherein, the felt is impregnated with the resin so that the pad has a Shore D hardness greater than about 47, a density from about 0.5 grams per cubic centimeter to about 0.7 grams per cubic centimeter, and a compressive modulus greater than about 70%.

8. The pad of claim 7, wherein the felt has a density of about 0.32 grams per cubic centimeter.

9. The pad of claim 7, wherein the pad has a Shore D hardness from about 47 to about 57.

10. The pad of claim 7, wherein the felt has a density of about 0.32 +/- 0.03 grams per cubic centimeter and the pad has a Shore D hardness from about 47 to about 57.

11. The pad of claim 7, wherein the resin comprises at least one of polyvinylchloride, polyvinylfluoride, nylon, fluorocarbon, polycarbonate, polyester, polyacrylate, polyether, polyethylene, polyamide, polyurethane, polystyrene, polypropylene, and copolymers and mixtures thereof.

12. The pad of claim 7, wherein the pad has a Shore D hardness from about 51 to about 54.

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13. A pad for chemical mechanical planarization of substrates for electronic device fabrication, the pad comprising:

a non-woven felt comprising polyester fibers, the felt having a denier of about 2, the felt having a density of about 0.32 +/- 0.03 grams per cubic centimeter; and

a polymer resin comprising polyurethane, the resin having a 100% modulus value of about 300 kg/cm to about 400 kg/cm;

wherein, the felt is impregnated with the resin so that the pad has a Shore D hardness from about 47 to about 57, a density of about 0.5 grams per cubic centimeter to about 0.7 grams per cubic centimeter, a polyurethane to fiber ratio of about 45:55, a compressive modulus greater than about 70%, a substantially homogeneous, substantially open pore structure sufficient for transporting amounts of a polishing slurry effective for CMP.

14. A pad according to claim 13, wherein the pad has air permeability greater than about 20 (cubic centimeters)/((square centimeter)(minute)).

15. A pad according to claim 13, wherein the pad has air permeability in the range of about 24 to about 34 (cubic centimeters)/((square centimeter)(minute)).

16. A pad according to claim 15, wherein the resin has a 100% modulus value of about 350 kg/cm, the ratio of weight percent fiber to weight percent resin is about 55:45, the felt comprises polyester, and the resin comprises polyurethane.

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17. A method of making a hard porous pad, the pad having a Shore D hardness from about 47 to about 57 and a density of about 0.5 grams per cubic centimeter to about 0.7 grams per cubic centimeter, the method comprising the steps of:

providing a non-woven felt of polymer fibers, the felt having a density greater than about 0.29 grams per cubic centimeter;

providing a resin;

impregnating the felt with the resin so that the ratio of weight percent fiber to weight percent resin is in the range from about 50:50 to about 65:35.

18. The method of claim 17, wherein the felt has a density of 0.32 +/- 0.03 grams per cubic centimeter.

19. The method of claim 17, wherein the resin has a 100% modulus value of about 300 kg/cm to about 400 kg/cm.

20. The method of claim 17, wherein the ratio of weight percent fiber to weight percent resin is about 55:45.

21. The method of claim 17, wherein the felt has a density of 0.32 +/- 0.03 grams per cubic centimeter, the resin has a 100% modulus value of about 350 kg/cm, the ratio of weight percent fiber to weight percent resin is about 55:45.

22. The method of claim 21, wherein the felt comprises polyester.

23. The method of claim 21, wherein the resin comprises polyurethane.